

WHAT IS CLAIMED IS

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1. A semiconductor device, comprising:

a compound semiconductor substrate having a resistivity less than  $1.0 \times 10^8$  Ohm-cm at least at surface thereof;

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a buffer layer formed on the compound semiconductor substrate and having a super lattice structure; and

an active layer formed on the buffer layer and having an active element formed therein.

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2. A semiconductor device as claimed in claim 1, wherein the compound semiconductor substrate has a resistivity less than  $0.6 \times 10^8$  Ohm-cm.

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3. A semiconductor device as claimed in claim 1, wherein the active layer is formed at a position within  $5.0 \mu\text{m}$  from the surface of the compound semiconductor substrate.

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4. A semiconductor device as claimed in claim 1, further comprising an electrode layer formed on another surface of the compound semiconductor substrate.

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5. A semiconductor device as claimed in  
claim 4, wherein the electrode layer is not  
5 electrically connected to the semiconductor device.

10 6. A semiconductor device as claimed in  
claim 4, wherein the electrode layer is connected to  
one power supply potential of the semiconductor device.

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7. A semiconductor device as claimed in  
claim 1, further comprising:  
20 a source electrode and a drain electrode  
formed on the active layer, separated from each other  
so as to establish a channel region, and  
a gate electrode formed above the channel  
region.

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8. A semiconductor device as claimed in  
30 claim 7, wherein the active layer has 2-Dimensional  
Electron Gasses.

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9. A semiconductor device as claimed in  
claim 1, wherein the active layer comprises:

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a collector layer of a first conducting
type;

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a base layer of a second conducting type  
formed on the collector layer;

5            an emitter layer of the first conducting  
type formed on the base layer.

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10. A semiconductor device as claimed in claim 1, wherein the compound semiconductor substrate has a resistivity more than  $1.0 \times 10^8$  Ohm-cm in total.

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11. A semiconductor device as claimed in claim 1, wherein the compound semiconductor substrate comprising a compound semiconductor support substrate having a resistivity more than  $1.0 \times 10^8$  Ohm-cm and a compound semiconductor having a resistivity less than  $1.0 \times 10^8$  Ohm-cm.